Supplementary Material S1

Patagial reflectance (300 – 700 nm) was measured with a JAZ EL–200 spectrometer, with inbuilt JAZ–PX pulsed xenon light source, calibrated using a diffuse white reflectance standard (Ocean Optics). Measurements were taken at a 45° angle relative to the surface. Sidewelling irradiance (90° from the ground) was measured with a JAZ–ULM–200 spectrometer and cosine corrected irradiance probe (Ocean Optics), and were normalised to a maximum of one for use in visual modelling. Irradiance measurements were taken at capture, between 0830 and 1030h (a period of heightened activity for the diurnal lizards).

Visual Modeling

The Vorobyev and Osorio [5] model calculates a receiver's ability to discriminate between two colours in units of just noticeable differences. The model requires the spectral sensitivities of the receiver – in this case birds, which have a tetrachromatic visual system with four single cones (UVS/VS, SWS, MWS, and LWS) and a double cone, used to detect luminance variation [13-16]. The spectral sensitivities were corrected for transmission of associated oil droplets (data from Endler and Mielke [17]). Although the spectral sensitivities of birds are either ultraviolet sensitive (UVS) with a UVS cone that peaks in sensitivity at 360 nm, or violet sensitive (VS) with a VS cone that peaks in sensitivity at 410 nm [14], we present results for the UVS system only. This is because all relevant spectra have low reflectance in the UV and violet wavelengths (thus there was no qualitative difference between results for the two visual systems) and the UVS system provides a more conservative estimate of colour differences across the full spectrum potentially visible to birds.

Spectra of the patagia colour and background colour (fallen leaves or foliage) were smoothed over 5 nm intervals between the range 300 and 700 nm, which corresponds to the visual system of birds. Irradiance spectra were similarly smoothed over 5 nm intervals and normalized to a maximum of 1. The irradiance used was always that of the local habitat.

First, we calculated photoreceptor quantum catches (Q_i) for each cone type (i) for patagia, fallen leaf and foliage colour with the equation:

$$Q_i = \int R_i(\lambda)S(\lambda)I(\lambda)\mathrm{d}\,\lambda$$

where $R_i(\lambda)$is the spectral sensitivity of cone i, $S(\lambda)$ is the spectral reflectance of the colour patch and $I(\lambda)$ is irradiance. We then applied the von Kries transformation which accounts for the receptors' adaption to the light environment and contributes to colour constancy [6, 18]. This entailed normalizing quantum catches (Q_i) to the background:

$$q_i = k_i Q_i$$

where

$$k_i = 1/\int R_i(\lambda)S^b(\lambda)I(\lambda)\mathrm{d}\,\lambda$$

and $S^b(\lambda)$ is the reflectance of the background.

The receptor signal (f_i) is proportional to the natural logarithm of the quantum catch: $f_i = \log(q_i)$). The contrast for a tetrachromatic visual system can then be calculated using the following equation:

$$(\Delta S)^2 = (\omega_1\omega_2)^2 (\Delta f_4 \Delta f_3)^2 + (\omega_1\omega_3)^2 (\Delta f_4 \Delta f_2)^2 +$$

$$(\omega_1\omega_4)^2 (\Delta f_3 \Delta f_2)^2 + (\omega_2\omega_3)^2 (\Delta f_4 \Delta f_1)^2 +$$

$$(\omega_2\omega_4)^2 (\Delta f_3 \Delta f_1)^2 + (\omega_3\omega_4)^2 (\Delta f_2 \Delta f_1)^2 /$$

$$((\omega_1\omega_2\omega_3)^2 + (\omega_1\omega_2\omega_4)^2 + (\omega_1\omega_3\omega_4)^2 + (\omega_2\omega_3\omega_4)^2)$$

where ΔS is the contrast between any two colours in units of JNDs and ω_i is the noise-to-signal ratio (Weber fraction). The higher the value of ΔS, the more distinguishable the two spectra. The Weber fraction is a measure of photoreceptor noise, which determines the discriminability of two colours. The Weber fraction can be calculated by:

$$\omega_i = v_i/\sqrt{\eta_i}$$

under bright illumination, where v_i is the noise-to-signal ratio of a single cone and η_i is the number of photoreceptors of type i. To calculate chromatic contrast (ΔS) we assumed that $\omega_i = 0.1$ for the long-wavelength sensitive (LWS) cone [5, 6] and derived ω_i values for the each other photoreceptor types using the equation above and a ratio of 1 ultraviolet sensitive (UVS) cone: 2 short-wavelength sensitive (SWS): 3.4 medium-wavelength sensitive (MWS): 3 LWS (for the UVS visual system) as outlined in Hart and Hunt [13]. Achromatic contrast was calculated as:

$$f_D = (\Delta f_D)/\omega_D$$

where we assumed that the double cone has a $\omega_i = 0.05$ [7]. Although the Vorobyev and Osorio model may not have been designed for comparisons of luminance, and absolute values should be interpreted with caution, results of the model are still indicative of real differences between colours.

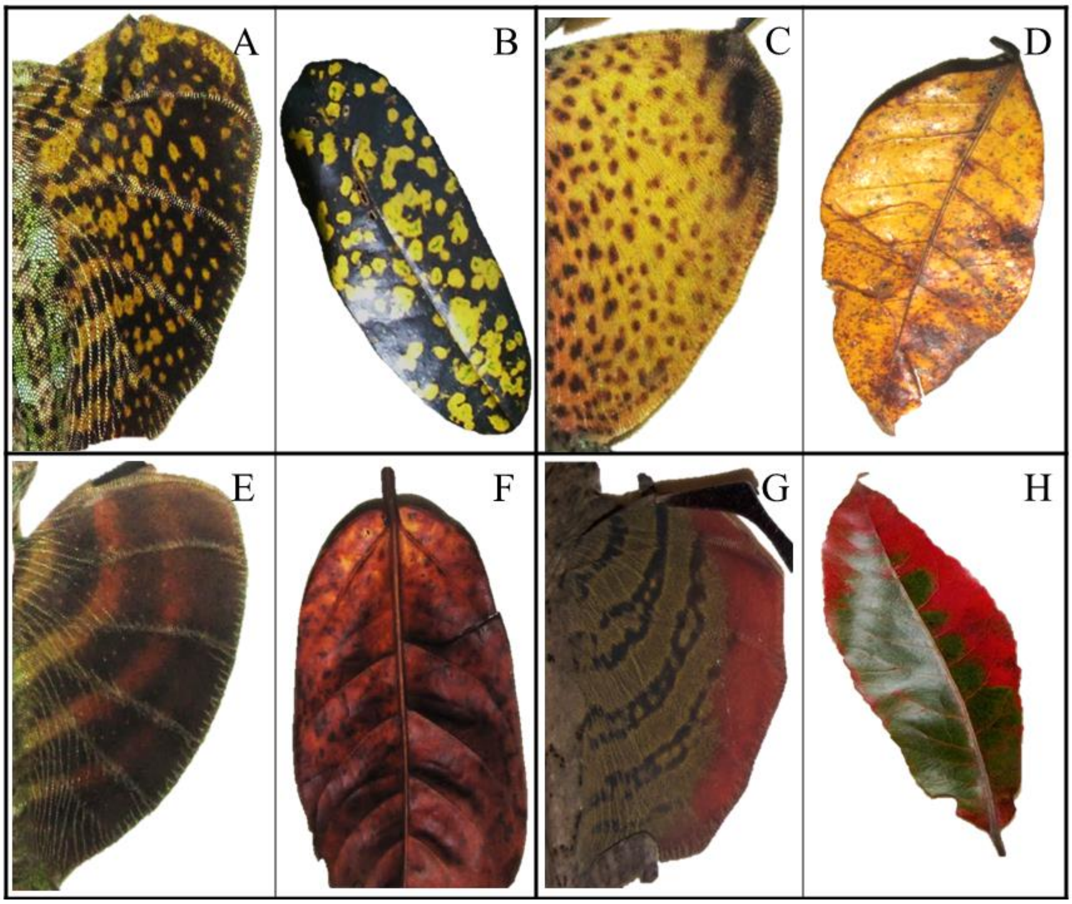

Figure S1: The patagia (*A*) of *Draco melanopogan*, the falling leaves in the immediate habitat of *Draco melanopogan* (*B*); the patagia of *Draco spilopterus* (*C*) and the falling leaves in its immediate habitat (*D*); the patagia of *Draco quinquefasciatus* (*E*) and the falling leaves in its immediate habitat (*F*); the patagia of *Draco formosus* (*G*) and the falling leaves in its immediate habitat (*H*).

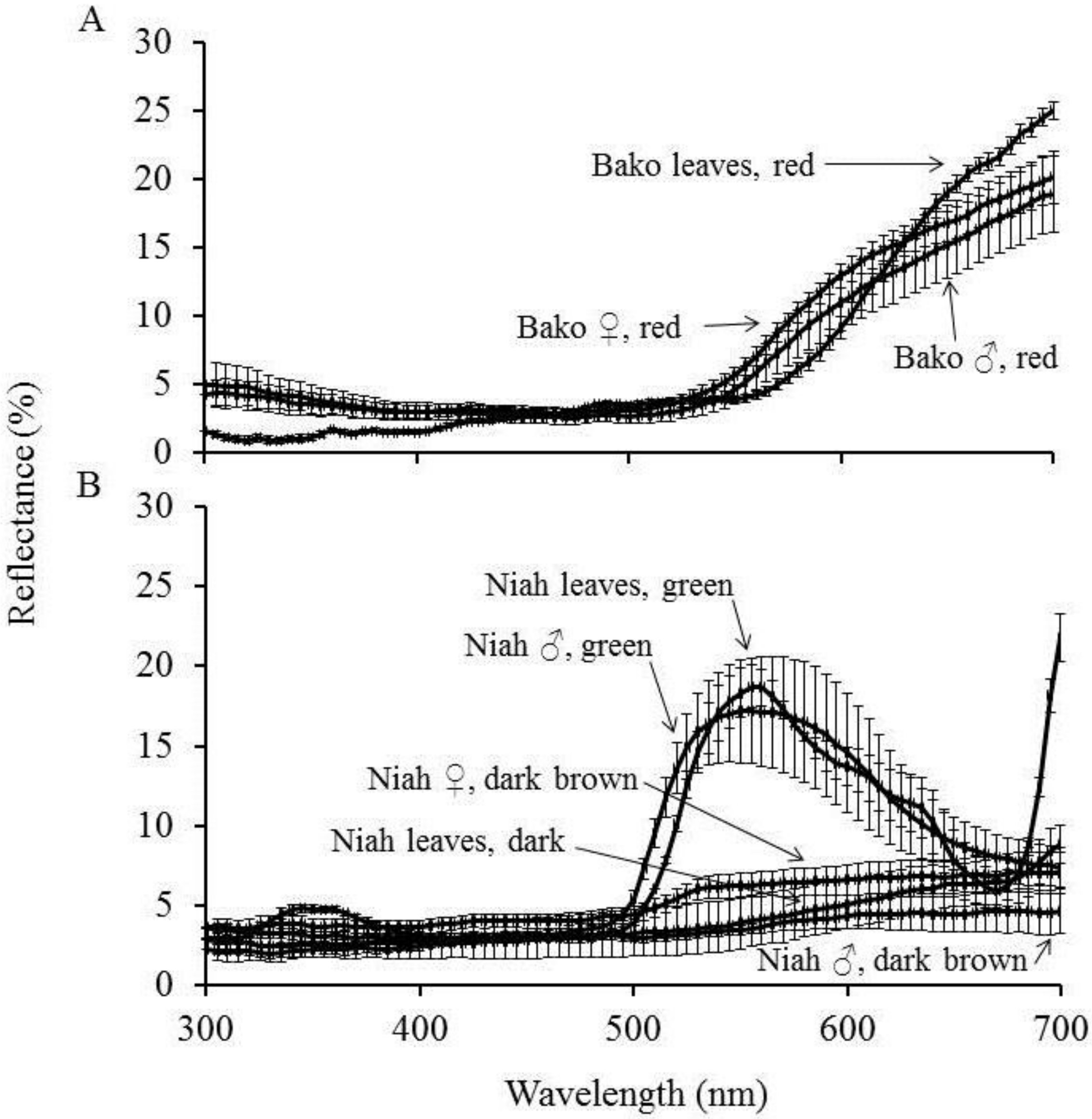

Figure S2: Spectra of predominant patagia colours of *Draco cornutus* and predominant falling leaf colours of (A) the Bako population and (B) the Niah population (means and standard error confidence intervals).